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ABSTRACT

To determine the cost/benefit relationship between education, incarceration, and welfare, a comparison was undertaken of the actual institutional costs required to produce an associate degree graduate at Miami-Dade Community College (M-DCC), in Florida, and the institutional costs of incarceration and welfare in the state. Costs analyses were conducted for 2,850 students who entered M-DCC in 1986 or later seeking an associate degree and who graduated during 1991-92 having earned at least 60 credits. The actual credits registered were multiplied by the full discipline cost per credit hour to determine the total institutional cost, which was then divided by the number of graduates to give an estimate of the average total institutional cost per graduate. The average time from admission to graduation for the study sample was found to be 4.01 years for Associate in Arts (AA) and 4.34 for Associate in Science (AS) graduates, resulting in average institutional costs of $10,248 per AA graduate and $13,888 per AS graduate. Average annual institutional costs were then calculated at $2,556 per AA graduate and $3,200 per AS graduate. After considering fees and tuition, the average annual costs to the state were determined to be $1,917 for each AA graduate and $2,400 per each AS graduate. The average annual operating cost for a Florida prison inmate was $13,902 in 1990, while the average cost per welfare recipient during 1990-91 was $4,500. Therefore, the average annual cost to the state for producing an AA graduate at M-DCC was 43% of the cost of welfare and 14% the cost of incarceration, while an AS graduate represented 53% of the cost of welfare and 17% of the cost of incarceration. Contains 16 references. (BCY)

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Miami-Dade Community College

EDUCATION, INCARCERATION, OR WELFARE?
A COMPARATIVE ANALYSIS OF INSTITUTIONAL COSTS

Research Report No. 93-11R

December 1993

Herman I. Brann
Senior Research Associate

Miami-Dade Community College

INSTITUTIONAL RESEARCH

Cathy Morris, Dean

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Abstract

Various studies have demonstrated a more favorable cost/benefit relationship for investments in education and training relative to investments in prisons and other welfare programs. Consequently, this study attempts to compare the actual institutional costs to produce an Associate Degree graduate at Miami-Dade Community College (M-DCC) with the institutional costs of incarceration and welfare in the State of Florida.

The population of graduates selected for this study was composed of all students seeking an Associate Degree, who entered M-DCC in 1986 or later, and graduated during the State Report Year 1991-1992. Cost analyses were conducted for 2,850 graduates from the study population who earned at least 60 credits each from M-DCC. The actual credits registered were multiplied by the full discipline cost per credit hour to give an estimate of the total institutional cost. The total institutional cost was then divided by the number of graduates to give an estimate of the average total institutional cost per graduate. The institutional cost per dropout was estimated in a similar manner.

For the students who entered M-DCC in 1986 or later, and graduated during the State Report Year 1991-1992, the weighted average time from admissions to graduation was 4.01 years for the A.A. graduates and 4.34 years for the A.S. graduates. The average institutional cost was $10,248 per A.A. graduate and $13,888 per A.S. graduate; therefore, the average annual institutional cost was $2,556 per A.A. graduate and $3,200 per A S. graduate. Adjusting for tuition and fees paid by students, the average cost to the State of Florida was $7,686 per A.A. graduate and $10,416 per A.S. graduate produced at M-DCC. The average annual cost to the State was, therefore, $1,917 per A.A. graduate and $2,400 per A.S. graduate.

In comparison, the average annual operating cost for a Florida State inmate (excluding overhead costs) was $13,902 in 1990, while the average cost per (duplicated) welfare recipient, in the State of Florida, during the 1990-1991 Fiscal Year, was approximately $4,500 for those on AFDC, or Food Stamps or Medicaid Programs. Considering that the cost per Florida inmate would be much higher if overhead costs were included, while the cost per welfare recipient would also be higher if the recipients were unduplicated, M-DCC was still able to produce an A.A. graduate for just over one-half (57%) of the annual cost of a Florida welfare recipient, and less than one-fifth (18%) of the annual operating costs for a Florida inmate. An A.S. graduate was produced for less than three-quarters (71%) of the annual cost of a Florida welfare recipient, and less than one-quarter (23%) of the annual operating costs of a Florida inmate.

Adjusting for tuition and fees paid by students, the State of Florida was able to produce an A.A. graduate at M-DCC for approximately two-fifths (43%) of the annual cost of a Florida welfare recipient, and approximately one-seventh (14%) of the annual operating cost for a Florida inmate. The State produced an A.S. graduate at M-DCC for approximately one-half (53%) of the annual cost of a Florida welfare recipient, and approximately one-sixth (17%) of the annual operating cost for a Florida inmate.

For the 1986 cohort, the average annual institutional cost was $1,818 per A.A. matriculating dropout and $1,737 per A.S. matriculating dropout. For the State of Florida, the average annual cost was $1,364 per A.A. matriculating dropout and $1,303 per A.S. matriculating dropout at M-DCC.

Education, Incarceration, or Welfare?
A Comparative Analysis of Institutional Costs

Introduction

Despite the results of many studies indicating a more favorable cost/benefit position for investments in education versus incarceration, Chambliss (1991) points out that:

> *For the first time in American history, cities are spending more on law enforcement than on education. Although the Federal Government has cut its education contribution by 25% (in real dollars) in the last decade, Federal spending for criminal justice has increased by 29%....Meanwhile, cities are forced to lay off teachers, cut public employee salaries, and reduce expenditures in every category except law enforcement...Also, imprisonment has failed to reduce crime for over two centuries....Reducing crime and violence will require a shift in priorities toward early education, drug rehabilitation, housing, and a safety net for families.*

At the same time, the Miami Herald reports that the percentage of Floridians dependent on welfare has doubled since 1987 and some state economists predict a further rise over the next few years (Miami Herald, July 12, 1993). The Miami Herald also reports that more than one-half of the welfare recipients receive benefits for more than two years, while approximately one in four receive benefits for four years or more. These trends suggest the need to re-examine investment policies for educational and training programs in order to reduce criminal activity, promote self-sufficiency, and eliminate welfare dependency.

The main purpose of this study, therefore, is to estimate the institutional cost to produce an Associate Degree graduate at Miami-Dade Community College, and compare this cost with other institutional costs such as incarceration and welfare. However, there are many other uses for average and marginal costs data of this type for policy and planning decisions at community colleges, such as : (i) comparing and analyzing graduate and dropout cost trends over time, (ii) comparing graduate and dropout costs among institutions, campuses, disciplines, departments, programs, etc.; and (iii) analyzing the cost impact for different policies involving curriculum changes, graduate projections, etc.

For the purposes of cost analysis, credits can be considered the basic components of an Associate Degree. However, as Duc-Le To pointed out (September 1987), there are many other extracurricular skills that students acquire which are not reflected in the credits they earn. More important, perhaps, is the fact that the ultimate outcomes of higher education are not the credits themselves, but the cognitive, non-cognitive, psychological and behavioral outcomes embodied in the credits earned (Astin 1993). This is particularly important when interpreting the value of credits earned by dropouts.

Methodology

The methodology used in this study is based on the concept that the production of a graduate at any college or university involves the production of credit hours, among other things. Therefore, the institutional cost of producing a graduate at M-DCC can be estimated by the cost of institutional resources utilized in producing the credit hours involved.

This study attempts to estimate the actual costs (rather than the theoretical costs) of graduates and dropouts at M-DCC by multiplying the actual number of credits registered by the cost per credit for a sample of graduates and dropouts who entered M-DCC between 1986 and 1990. All cost data reflect the full costs of the discipline, and include the following: (i) costs directly related to instruction and student services; (ii) support costs such as academic support, libraries, institutional support, plant operation and maintenance, and other educational and general expenditures; and (iii) mandatory transfers. Costs irrelevant to instruction and student services such as public service, general (non-institutional) research and auxiliary enterprises are excluded.

Institutional costs per credit hour by discipline, course, and campus have been computed by M-DCC since the 1980's. Therefore, if we can estimate the average number and type of credit hours required to obtain an Associate Degree at M-DCC, we can, based on the cost of the credits required, estimate the average cost to produce a graduate.

Students who graduated from M-DCC during the State Report Year 1991-1992 were identified from the graduate file at M-DCC (IRS50). M-DCC graduated 5,088 students

during the period, some of whom entered M-DCC during the last three decades. Since appropriate cost data were not readily available prior to 1986, the population of graduates selected for this study was composed of all Associate in Arts and Associate in Science students, who entered M-DCC in 1986 or later, and graduated from M-DCC during State Report Year 1991-1992. There were 3,759 graduates (or 73.9% of all graduates) in this category.

In order to select only those graduates who completed a significant proportion of their credits at M-DCC, a further restriction was imposed that total credit hours earned must be greater than 60. This restriction reduced the study population to 2,850 graduates (or 56.0% of all graduates), and also served to eliminate some graduates with a high proportion of transfer credits.

In order to isolate only those credits resulting from a significant input of M-DCC resources, it was necessary to eliminate all transfer credits, and credits earned through CLEP and CBE (credit by exam) activities. Moreover, since teaching resources are allocated on the basis of credits registered, the appropriate credits for cost analysis would be M-DCC credits registered rather than credits attempted or credits earned. However, data on M-DCC credits registered were not available on the graduate summary file; therefore, these data were derived from the formulas in Appendix A.

Data on the total number of credit hours registered were distributed equally over a period of four years for those graduates who entered M-DCC in 1986 and 1987; three years for those who entered in 1988 and 1989; and two years for those who entered in 1990. An average of 4.2 credits per A.A. graduate and 7.7 credits per A.S. graduate was costed at the College Preparatory rate (see Appendix B). In addition, an average of 15 credits per A.S. graduate was costed at the Advanced and Professional rates (A & P), based on curriculum requirements. A & P credits taken by A.S. graduates were distributed at the rate of six per student during the admit year, and nine per student during the subsequent year. A cost adjustment was also made for A.S. credits taken by A.A. Business majors (see Appendix C).

Institutional Costs per Graduate

The data in Table 1 reveal that, college-wide, there were 2,337 A.A. graduates and 513 A.S. graduates who entered M-DCC between 1986 and 1990, earned at least 60 credit hours at M-DCC, and graduated during the State Report Year 1991-1992. The average institutional cost was $10,248 per A.A. graduate, and $13,888 per A.S. graduate. The institutional cost per A.S. graduate was, therefore, about $3,640 or 36% higher than the cost per A.A. graduate. The average cost to the State, however, was approximately $7,686 per A.A. graduate, and $10,416 per A.S. graduate, since tuition and fees paid by students comprise approximately 25% of the institutional costs.

The average number of credit hours registered was 90.33 per A.A. graduate and 103.58 per A.S. graduate. The relatively higher institutional costs per A.S. graduate reflect both the higher cost per credit hour for occupational courses, and the higher number of credit hours registered. Much of the higher cost per credit hour for A.S. programs is associated with the higher costs of classroom equipment and supplies, and the smaller class sizes required.

From the standpoint of policy decisions concerning resource allocation, however, cost comparisons, by themselves, could be misleading, unless there is some notion of the associated benefits and impacts. Policies to restrict A.S. program enrollments because of cost differentials should be avoided, since such policies will eventually reduce the supply of skilled personnel in these occupational areas, with attendant increases in wages, the costs to produce the related services, and, ultimately, the price of these services to consumers. Instead, consideration should be given to the fact that the market value for A.S. graduates is generally higher than that for A.A. graduates. Earnings data for Florida graduates, during the period October to December 1991, reveal that A.S. graduates earned an average of $6,712 ($26,848 annually), while A.A. graduates earned $4,656 ($18,624 annually), and Baccalaureate degree graduates $5,731 ($22,924 annually) (Report Prepared for the Postsecondary Education Planning Commission, FETPIP, June 1993).

Table 1

Average Total Institutional Cost per Graduate
For Associate in Arts and Associate in Science Degree Students
Who Entered Miami-Dade Community College Between 1986 and 1990,
Earned at Least 60 Credit Hours at M-DCC
And Graduated During the State Report Year 1991-92

COLLEGE-WIDE

	Associate in Arts Graduates					Associate in Science Graduates				
Admit Year	Number of Graduates	Total Credit Hours Registered (M-DCC)	Distributed Credit Hours [1]	A & P Cost Per Credit Hour ($) [3]	Total Cost (Current $) [2]	Number of Graduates	Total Credit Hours Registered (M-DCC)	Distributed Credit Hours [1]	Occupational Cost Per Credit Hour ($)	Total Cost (Current $) [2]
1986	272	29,663	7,416	102.04	769,372 *	101	12,399	3,100	118.53	353,221 *
1987	432	44,263	18,482	109.66	2,032,977	138	15,370	6,942	130.18	806,632
1988	763	69,728	41,724	115.79	4,815,250	143	14,105	11,644	135.85	1,506,004
1989	788	61,782	62,318	116.85	7,267,944	102	9,045	14,659	140.02	2,038,705
1990	82	5,658	57,731	111.60	6,441,827	29	2,218	12,668	141.27	1,842,774
1991	0	0	23,423	109.06	2,554,512 **	0	0	4,124	134.07	577,258 **
Total	2,337	211,094	211,094		23,881,884	513	53,137	53,137		7,124,593
Average Per Graduate		90.33			$10,248 [4]		103.58			$13,888

[1] 1986 and 1987 total credits distributed equally over 4 years; 1988 and 1989 credits distributed equally over 3 years; and 1990 credits distributed equally over 2 years.

[2] An average of 4.2 credits per A.A. graduate and 7.7 credits per A.S. graduate is costed at the College Preparatory rate (see Appendix B for estimating procedure). In addition, an average of 15 credits per A.S. graduate is costed at the A&P rate based on curriculum requirements. These A&P credits were distributed at the rate of 6 per student during the admit year and 9 per student during the subsequent year. Cost per credit hour for college preparatory courses was $113.13 in 1987; $110.80 in 1988; $112.64 in 1989; ;$108.70 in 1990; and $109.20 in 1991.

[3] As of 1990, expenditures of federal funds and depreciation expenses were excluded from the total costs.

[4] Including an average of $29 per graduate for the cost of "Office" credits taken by Business majors (see Appendix C for estimating procedure).

* College Preparatory credits costed at the 1987 rates, since the 1986 rate was not available.

** All credits costed at either the A&P rate for A.A. graduates or the Occupational rate for A.S. graduates.

Source: M-DCC Graduate File (IRS50), Cohort File (IRS31), and Cost Analyses (CA-2).

Institutional Costs per Dropout

The analysis of dropouts in this study departs from the view held by some analysts that dropout credits are wasted or lost, to the extent that they do not result in graduation, and that, consequently, the costs of dropout credits should be applied to the costs of graduate credits (Duc-Le To, p.41). While the market value for higher education credits may differ for graduates and non-graduates, the intrinsic value lies in the cognitive, non-cognitive, psychological and behavioral outcomes embodied in these credits. Therefore, while it is necessary to continue to design programs to minimize the number of dropouts, it is unrealistic to suggest that credits earned by dropouts are wasted or lost.

It is well known that many businesses produce joint products and by-products. These products may be traded at their best market value or reallocated within the firm based on their costs of production, estimated market value, internal prices, etc. Likewise, colleges and universities can be thought of as producing a primary product composed of graduating credits and a by-product composed of non-graduating credits (dropouts). Both the primary product and the by-product have distinct market values. Moreover, non-graduating credits are likely to remain a significant by-product for community colleges, given their open enrollment policies.

Various studies have shown that the lifetime income of individuals completing one or more years of college is usually greater than those completing high school only. Table 2, reprinted from Duc-Le To's study, illustrates some of these income differentials. Therefore, there seems to be no economic justification for applying the cost of non-graduating credits to the cost of graduating credits, unless we are also interested in comparing these <u>combined costs</u> with the <u>combined market values</u> of graduates and non-graduates, or comparing the combined costs of different programs (the subject of a future report). The important point here is to distinguish between the cost per graduate, the cost per dropout, and the combined costs of graduates and dropouts, and determine which of these cost items will be most appropriate for a particular analysis.

Table 2

Lifetime Income of Men, by Years of School Completed:
United States, Selected Years, 1949-1972
(In Current Dollars)

	Years					
Years of School Completed	1949	1956	1961	1964	1968	1972
(1) High School	$ 175,160	$ 244,158	$ 273,614	$ 311,462	$ 371,094	$ 478,873
(2) College, 1-3 Years	198,268	278,227	335,100	355,249	424,280	543,435
(3) College, 4 or More Years	280,989	372,644	454,732	478,696	607,921	757,923
Difference:						
(2) - (1)	23,108	34,069	61,486	43,787	53,186	64,562
(3) - (1)	105,829	128,486	181,118	167,234	236,827	279,050
Ratio:						
(2)-(1)/(3)-(1)	0.22	0.26	0.34	0.26	0.22	0.23

Sources: 1949: Houthakker [1959], Table 3.
1956-1972: Cohn [1979], Table 3-2.

(Reprinted from Duc-Le To's Study, Table 20, Page 43).

Two six-year cohort files (IRS31) were used to analyze the dropouts in this study. These cohorts were composed of all first-time-in-college students who entered M-DCC in the Fall of 1986 and 1987. A dropout was identified as any student who was not enrolled during the last two consecutive academic years of the six-year tracking period, and did not graduate. For the 1986 cohort, for example, a first-year dropout would not have been enrolled for any of the academic years beyond 1986, and did not graduate. Likewise, a second-year dropout would not have been enrolled for any of the academic years beyond 1987, and did not graduate.

Table 3 provides cost data for the dropouts who left during the first four years of the six-year tracking period, for both the 1986 and 1987 cohorts. Four years was also the average time from admissions to graduation for the sample of graduates studied. Dropouts were classified by matriculation intentions. The similarity in the dropout rates and credits registered for the two cohorts, by matriculation intentions, suggests that these data will be particularly useful for institutional policy and planning concerning dropouts.

Cumulative dropout rates for the A.A. matriculating students averaged approximately 22% at the end of the first year, 32% at the end of the second year, 42% at the end of the third year, and 49% at the end of the fourth year. Dropout rates for the A.S. matriculating students were much higher than those for the A.A. matriculating students and averaged about 34% at the end of the first year, 47% at the end of the second year, 55% at the end of the third year, and 62% at the end of the fourth year. From a policy standpoint, therefore, efforts to reduce the dropout rate should be more intense during the first two years of college, with special programs for the A.S. matriculating students.

Average costs per dropout during the four-year period were also very similar for the A.A. matriculating students in each cohort ($3,891 per dropout for the 1986 cohort, and $3,963 per dropout for the 1987 cohort), but were slightly higher than the dropout costs for the A.S. matriculating students ($3,543 per dropout for the 1986 cohort, and $3,221 per dropout for the 1987 cohort). Therefore, the institutional cost of a dropout with A.A. matriculating intentions was approximately two-fifths (38%) of the institutional cost of an

Table 3

Average Total Institutional Cost Per Dropout
For First-Time-in-College Students
Matriculating in the Associate in Arts and Associate in Science Degree
Who Entered M-DCC in 1986 and 1987, and
Dropped Out During the Subsequent Four-Year Period

College-Wide

Associate in Arts Matriculating Dropouts

Academic Year Dropped Out	Number of Dropouts 1986 Cohort	Number of Dropouts 1987 Cohort	Cumulative Dropout Rate (%) 1986 Cohort (N=5,294)	Cumulative Dropout Rate (%) 1987 Cohort (N=5,629)	Total Credits Registered 1986 Cohort	Total Credits Registered 1987 Cohort	Distributed Credits* 1986 Cohort	Distributed Credits* 1987 Cohort	Total Cost (Current $)** 1986 Cohort	Total Cost (Current $)** 1987 Cohort
1986	1,195	0	22.6	0.0	17,315	0	43,518	0	4,923,191	0
1987	593	1,228	33.8	21.8	23,223	18,773	26,203	45,571	2,873,421	5,155,447
1988	466	601	42.6	32.5	26,403	23,008	14,592	26,798	1,689,608	3,102,940
1989	358	489	49.3	41.2	23,163	25,423	5,791	15,294	676,678	1,787,104
1990	0	409	-	48.6	0	27,279	0	6,820	0	761,112
Total	2,612	2,727	-	-	90,104	94,483	90,104	94,483	10,162,898	10,806,603
Average per A.A. Matriculating Dropout					34.50	32.34			$3,891	$3,963

Associate in Science Matriculating Dropouts

Academic Year Dropped Out	Number of Dropouts 1986 Cohort	Number of Dropouts 1987 Cohort	Cumulative Dropout Rate (%) 1986 Cohort (N=1,305)	Cumulative Dropout Rate (%) 1987 Cohort (N=1,300)	Total Credits Registered 1986 Cohort	Total Credits Registered 1987 Cohort	Distributed Credits* 1,986 Cohort	Distributed Credits* 1,987 Cohort	Total Cost (Current $)*** 1986 Cohort	Total Cost (Current $)*** 1987 Cohort
1986	425	0	32.6	0.0	6,236	0	12,408	0	1,403,717	0
1987	166	477	45.3	36.7	5,847	5,898	6,172	11,538	783,033	1,305,294
1988	111	153	53.8	48.5	5,884	5,403	3,249	5,640	421,337	747,779
1989	85	100	60.3	56.2	5,150	4,558	1,288	2,939	180,346	390,666
1990	0	91	-	63.2	0	5,677	0	1,419	0	200,462
Total	787	821	-	-	23,117	21,536	23,117	21,536	2,788,433	2,644,201
Average per A.S. Matriculating Dropout					29.37	26.23			$3,543	$3,221

* Second-year dropout credits distributed equally over two years; third-year dropout credits distributed equally over three years; and fourth-year dropout credits distributed equally over four years.

** First-year dropout credits costed at the College Preparatory rate. Other credits costed at the A/P rate.

*** First-year dropout credits costed at the College Preparatory rate. An average of 6 credits per dropout in the 2nd year and 9 in the 3rd year was costed at the A/P rate. All other credits were costed at the Occupational rates.

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A.A. graduate, while the institutional cost of a dropout with A.S. matriculating intentions was approximately one-fourth (26%) of the institutional cost of an A.S. graduate.

Adjusting for the cost of tuition and fees paid by students (approximately 25% of institutional costs), the average cost to the State for a dropout with A.A. matriculating intentions would be approximately $2,918 for the 1986 cohort and $2,972 for the 1987 cohort. For a dropout with A.S. matriculating intentions, the average State cost would be approximately $2,657 for the 1986 cohort and $2,416 for the 1987 cohort.

Cost Comparisons: Education, Incarceration and Welfare

The data in Table 1 revealed that the weighted average time from admission to graduation from M-DCC was 4.01 years for the A.A. graduates and 4.34 years for the A.S. graduates. At an average institutional cost of $10,248 per A.A. graduate and $13,856 per A.S. graduate, the average annual institutional cost was $2,556 per A.A. graduate and $3,200 per A.S. graduate. Likewise, the weighted average number of years from admission to discontinuing enrollment for the dropouts in the 1986 cohort was 2.14 years for the A.A. matriculating dropouts, and 2.04 years for the A.S. matriculating dropouts, giving an average annual institutional cost of $1,818 per A.A. matriculating dropout and $1,737 per A.S. matriculating dropout. Similar estimates of the average State costs are provided in Table 4.

In 1990, the average annual operating cost for a Florida State inmate was $13,902, excluding indirect costs (Bureau of Statistics, Department of Justice). At the same time, the average cost per duplicated welfare recipient in the State of Florida during the 1990-1991 Fiscal Year was approximately $4,500 for those on any one of the following programs: AFDC, or Food Stamps, or Medicaid (State of Florida, Department of Economic Statistics). Since many welfare recipients participate in more than one program concurrently, the average cost per unduplicated recipient (i.e., per actual person) would be higher than the $4,500 quoted per duplicated recipient. Welfare costs did include both direct and overhead costs.

Table 4

Comparison of Average Costs to M-DCC and the State of Florida
For Graduates and Dropouts Produced at M-DCC, and the Relationship
of Graduate Costs to Welfare and Incarceration Costs

	Associate in Arts (A.A.)			Associate in Science (A.S.)		
		Dropouts			Dropouts	
Cost Items	Graduates	1986 Cohort	1987 Cohort	Graduates	1986 Cohort	1987 Cohort
Average Total Cost to:						
(i) M-DCC ($)	10,248	3,891	3,963	13,856	3,543	3,221
(ii) State of Florida ($)	7,686	2,918	2,972	10,416	2,657	2,416
Average Annual Cost to:						
(i) M-DCC ($)	2,556	1,818		3,200	1,737	
(ii) State of Florida ($)	1,917	1,364		2,400	1,303	
Average Annual Graduate Cost as a Percent of Annual Welfare Cost for:						
(i) M-DCC	57%			71%		
(ii) State of Florida	43%			53%		
Average Annual Graduate Cost as a Percent of Annual Prison Cost for:						
(i) M-DCC	18%			23%		
(ii) State of Florida	14%			17%		

Table 4 provides a comparison of the average costs to M-DCC and the State of Florida for graduates and dropouts produced at M-DCC, and the relationship of graduate costs to welfare and incarceration costs. A comparison of these costs reveal that M-DCC was able to produce an A.A. graduate for just over one-half (57%) of the annual cost of a Florida welfare recipient, and less than one-fifth (18%) of the annual operating cost for a Florida inmate. An A.S. graduate was produced for less than three-quarters (71%) of the annual cost of a Florida welfare recipient, and less than one-quarter (23%) of the annual operating cost for a Florida inmate.

The State of Florida was able to produce an A.A. graduate at M-DCC for approximately two-fifths (43%) of the annual cost of a Florida welfare recipient, and approximately one-seventh (14%) of the annual operating cost for a Florida inmate. The State produced an A.S. graduate at M-DCC for approximately one-half (53%) of the annual cost of a Florida welfare recipient, and approximately one-sixth (17%) of the annual operating cost for a Florida inmate. From the standpoint of state and national economic policy, therefore, these data suggest that more favorable cost/benefit ratios will be derived by reallocating more resources to education and training relative to incarceration and welfare.

The Community College System in Florida can play an important role in the education and training of inmates and welfare recipients. Perhaps it will be useful to evaluate the GAIN (Greater Avenues for Independence) program for welfare recipients in California, with the view of implementing similar programs in Florida. The Community College System in California is a major provider for GAIN participants.

Appendix A

DERIVED FORMULA FOR ESTIMATING "M-DCC HOURS REGISTERED"

Given:

(i) M-DCC Credits (IRS50) = Total Credits* - Transfers - CLEP.....Eq.(1) (IRS40/50)

(ii) Total Hours Registered (IRS40) = All Credit Activity (Excluding Audits/Incompletes)**.....Eq.(2)

These Include:
- (i) Credits for Grades A-F, S, P, U, and W;
- (ii) College Preparatory;
- (iii) CLEP;
- (iv) CBE;
- (v) Transfers

(iii) Total Hours Earned (IRS40/50) = All Credit Activity with a Passing Grade (Excluding Audits/Incomplete)

These Include:
- (i) Credits for Grades A-D, S and P;
- (ii) College Preparatory;
- (iii) CLEP;
- (iv) CBE;
- (v) Transfers

= Total Hours Registered - W's - F's - U's .....Eq.(3)

(iv) Total Hours Attempted (IRS40/50) = All Credit Activity with a Letter Grade Except W's, but also Excludes:
- (i) College Preparatory
- (ii) CLEP

= Total Hours Earned - College Preparatory - CLEP + F's + U's .....Eq.(4a)

or

= Total Hours Registered - W's - College Preparatory - CLEP .....Eq.(4b)

Therefore, From Eq.(1) above, M-DCC Hours Earned = Total Hours Earned - Transfers - CLEP (This Excludes W's, F's and U's but Includes CBE).

However, From Eq.(3) above, W's + F's + U's = Total Hours Registered - Total Hours Earned.

Therefore, M-DCC Hours Registered = M-DCC Hours Earned + (Total Hours Registered - Total Hours Earned) - CBE

*Total Credits on IRS50 (Cols. 34-39) = Cumulative Credits as a Result of Year/Term on IRS40 (Cols. 152-163).
**Audits and Incompletes are not reported.

Appendix B

Procedure For Estimating the Average Number of College Preparatory Credits Taken by Graduates

Data		Associate in Arts Graduates (A.A.)	Associate in Science Graduates (A.S.)
(i)	Percent of graduates taking College Preparatory courses (M-DCC Data)	36%	57%
(ii)	Therefore, estimated number of graduates taking College Preparatory courses (Table 1)	36% of 2,337 = 841	57% of 513 = 292
(iii)	Average number of credits per graduate (Table 1)	90.33	103.58
(iv)	Therefore, estimated total credits taken by graduates who took College Preparatory courses	841 X 90.33 = 75,967.53	292 X 103.58 = 30,245.36
(v)	College Preparatory credits as a percent of all M-DCC credits (M-DCC Data)	13%	13%
(vi)	Therefore, estimated number of College Preparatory credits taken by graduates who took these courses	13% of 75,967.53 = 9,875.78	13% of 30,245.36 = 3,931.90
(vii)	Therefore, the average number of College Preparatory credits per graduate taking College Preparatory Courses	9,875.78 ÷ 841 = 11.7	3,931.90 ÷ 292 = 13.5
(viii)	And, the average number of College Preparatory credits per graduate in the study population	9,875.78 ÷ 2,337 = 4.2	3,931.90 ÷ 513 = 7.7

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Appendix C

Procedure for Estimating the Average Cost of A.S.
"Office" Credits Taken by A.A. Graduates

Approximately 25% of the A.A. graduates in this study were Business majors who took business courses in the A.S. Office discipline. The costs of these A.S. courses are generally higher than the A & P costs for most A.A. courses. The estimating procedure for the cost of Office credits taken by Business majors is as follows:

(i) Twenty-five percent or 584 of the A.A. graduates in this study were Business majors (2,337 x .25).

(ii) A.A. Business majors registered for an average of 13 A.S. Office credits, for a total of 7,592 Office credits (584 x 13), or 3.6% of all A.A. credits (7,592 ÷ 211,094).

(iii) The average cost differential between A.S. Office credits and A & P credits was $9.00 ($119 per Office credit and $110 per A & P credit).

(iv) The total cost increase for Office credits was, therefore, $68,328 (7,592 x $9.00), giving an average cost increase of $29.00 per A.A. graduate ($68,328 ÷ 2,337).

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